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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,651	11/17/2000	Harold Alexis Huggins	Huggins 6 (58638)	8052

27964 7590 08/13/2003

HITT GAINES P.C.  
P.O. BOX 832570  
RICHARDSON, TX 75083

EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

15

**Office Action Summary**

Application No.

09/715,651

Applicant(s)

HUGGINS, HAROLD ALEXIS

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4,5,8,9,11-14,17,20-24 and 26-35 is/are pending in the application.

4a) Of the above claim(s) 29-35 is/are withdrawn from consideration.

- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

- 6) ☒ Claim(s) 1,4,5,8,9,11-14,17,20-24 and 26-28 is/are rejected.

- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.

- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some \* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)

- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_

- 5) ☐ Notice of Informal Patent Application (PTO-152)

- 6) ☐ Other:

### DETAILED ACTION

1. The Appeal Brief filed on 5/6/2003 has been considered. However, the arguments presented in the brief are moot in view of the following new ground of rejection.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4, 5, 8, 11-14, 17, 20, 22-24, 26, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al (US 6,355,498) in view of Marshall et al (US 5,067,004)

Chan discloses a method for fabricating a new bulk resonator/RF component. This method comprises the steps of:

forming a isolation/dielectric layer 14 on a semiconductor substrate 10 (col 4, lines 26-27)

forming a patterned electrode/conductive layer 18 on the dielectric layer 14 to form a resonator (col 4, lines 39-52, fig. 5 ), which reads on forming and patterning a conductive layer on the dielectric layer to define the RF component

forming a plurality of vias/ openings 26 on opposite sides of electrode 18 through the piezoelectric material to the semiconductor substrate 10 to define the resonator/RF

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component, the vias 26 having a diameter between 5 and 20 microns and evenly spaced around the electrodes (col 5, lines 6-12) ,

introducing through the vias/openings 26 an gaseous etchant of  $\text{XeF}_2$  to the substrate to etch away an area beneath the AlN layer to form a cavity to the surface of the isolation layer on the supporting wafer having an unsupported area that includes the resonator (col 5, lines 18-35), which reads on releasing the RF component from the semiconductor substrate by exposing the semiconductor substrate to a dry etchant comprising  $\text{XeF}_2$  passing through the at least openings to the semiconductor substrate

Unlike the instant claimed inventions as per claims 1, 14, 23, Chan fails to disclose that the substantially uniform spacing between adjacent openings in a range of about 20-200 microns although Chan that the vias/openings are evenly spaced around the electrodes

However, Marshall, in a method for forming interconnecting integrated circuit, discloses that the space between the vias on a semiconductor substrate is 42 microns (overlaps the claimed range) (col 5, lines 22-25)

Since Chan discloses that his vias having a diameter of 5-20 microns, one skilled in the art would have found it obvious to modify Chan's method by forming the via in an uniform spacing between adjacent openings in the range as per Marshall because Marshal states that the minimum space between any two vias is 42 microns for vias that are no more than 100 microns in diameter (col 5, lines 22-24)

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Regarding claims 4-5, 17, Chan discloses forming a plurality of vias/openings adjacent to the conductive layer 18, the openings do not extend through the conductive layer 18 (fig. 8)

Regarding claims 8, 20, 26, Chan discloses that the electrode/conductive layer is aluminum (col 4, line 39 )

The limitation of claim 24 has been discussed above.

Regarding claims 11, 22, 28, Chan discloses that the substrate is silicon ( col 4, lines 24-25 )

Regarding claims 12, 13, fig. 8 of Chan shows that the openings 26 contacts the cavity 28 in the substrate which reads on the openings extend into the substrate.

4. Claims 9, 21, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al (US 6,355,498) in view of Marshall et al (US 5,067,004) and further in view of Mang et al (US5,692,279)

Chan as modified by Marshall has been described above. Chan and Marshall differ from the instant claimed inventions as per claims 9, 21, 27 by forming a dielectric layer of silicon oxide instead of silicon nitride

However, Mang, in a method of making a resonator, discloses forming a dielectric layer of silicon oxide or SiN on the upper surface of the electrode (col 4, lines 62-64)

Since both Chan and Mang are directed to a method of forming resonator, one skilled in the art would have found it obvious to substitute Chan and Marshall silicon

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oxide dielectric layer with SiN in view of Mang teaching since Mang states that silicon oxide or SiN can be used as convenient dielectric material (col 4, lines 62-64)

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703 305-2667. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV

August 5, 2003